

Claims

1. (*CURRENTLY AMENDED*) A method of controlling transmission of media access control (MAC) data packets with MAC headers in a power line communication (PLC) local area network (LAN) having a plurality of PLC stations and at least one PLC media access control (MAC) bridging device for bridging packets between the PLC LAN and a non-PLC LAN, the method comprising:

providing a PLC central coordinator in the PLC LAN for managing allocation of PLC LAN resources;

assigning by the PLC central coordinator a temporary equipment identifier (TEI) for each PLC station and PLC MAC bridging device;

at a PLC MAC bridging device, for a packet from a non-PLC source station wherein the packet has a MAC header containing the source MAC address and the destination MAC address for a PLC destination station, modifying the MAC header by removing the source MAC address and destination MAC address from the MAC header and inserting into the MAC header a ConnectionID, the ConnectionID identifying the PLC MAC bridging device's TEI and the PLC destination station's TEI; and

transmitting said packet with said modified MAC header having the ConnectionID but not having the source MAC address and the destination MAC address from the PLC MAC bridging device to the PLC destination station.

2. *(CURRENTLY AMENDED)* The method of claim 1 further comprising:

at the PLC MAC bridging device, for a packet from a PLC source station wherein the packet has a modified MAC header containing a ConnectionID but not containing the source MAC address and destination MAC address, the ConnectionID identifying the PLC source station's TEI and the PLC MAC bridging device's TEI, removing the ConnectionID in the modified MAC header and inserting into the modified MAC header the source MAC address and destination MAC address for a non-PLC destination station; and

transmitting said packet with said source and destination MAC addresses in the MAC header but without the ConnectionID in the MAC header from the PLC MAC bridging device to the non-PLC destination station .

3. *(PREVIOUSLY CANCELED)*

4. *(PREVIOUSLY AMENDED)* The method of claim 1 wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the PLC LAN.

5. *(PREVIOUSLY AMENDED)* The method of claim 1 wherein the PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device.

6. *(PREVIOUSLY AMENDED)* The method of claim 1 wherein the PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device.

7. *(PREVIOUSLY AMENDED)* The method of claim 1 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridging device.

8. *(ORIGINAL)* The method of claim 1 which includes bridging packets across the PLC LAN only in PLC bridging devices.

9. *(PREVIOUSLY CANCELED)*

10. *(PREVIOUSLY AMENDED)* The method of claim 1 which includes interworking the bridged packets between the PLC LAN and a non-PLC LAN using the ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN.

11. *(PREVIOUSLY CANCELED)*

12. *(PREVIOUSLY CANCELED)*

13. *(ORIGINAL)* The method of claim 1 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

14. (*CURRENTLY AMENDED*) A method of bridging media access control (MAC) data packets with MAC headers between stations in a power line communication (PLC) local area network (LAN) having at least one PLC MAC bridging device and stations in a non-PLC LAN, the method comprising:

providing a PLC central coordinator in the PLC LAN for managing allocation of PLC LAN resources;

assigning by the PLC central coordinator a temporary equipment identifier (TEI) for each PLC station and PLC MAC bridging device;

at a PLC MAC bridging device, for a first packet bridged from a non-PLC source station wherein said first packet has a non-PLC MAC header containing the source 48-bit MAC address and the destination 48-bit MAC address for a PLC destination station, modifying said first bridged packet by removing the 48-bit MAC addresses from the non-PLC MAC header and inserting into the non-PLC MAC header a ConnectionID containing the TEI of the PLC destination station, and transmitting said modified first bridged packet with the non-PLC header having said inserted ConnectionID but not having the 48-bit MAC addresses from the PLC MAC bridging device to the PLC destination station; and

at a PLC MAC bridging device, for a second packet bridged from a PLC source station wherein said second packet has a PLC MAC header with having a ConnectionID containing the TEI of the PLC source station and the TEI of said bridging device but not having 48-bit MAC addresses, modifying said second bridged packet by removing the ConnectionID from the PLC MAC header and inserting into the PLC MAC header the 48-bit MAC address of the non-PLC destination station, and transmitting said modified second bridged packet with the PLC MAC header having the inserted 48-bit MAC address of the

non-PLC destination station ~~and without~~ but not having said ConnectionID from the PLC MAC bridging device to the non-PLC destination station.

15. *(PREVIOUSLY AMENDED)* The method of claim 14 wherein said at least one PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device; and wherein said at least one PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device.

16. *(PREVIOUSLY AMENDED)* The method of claim 14 wherein said at least one PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridging devices on the PLC LAN.

17. *(PREVIOUSLY CANCELED)*

18. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridging device.

19. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes bridging packets across the PLC LAN only in PLC MAC bridging devices.

20. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

21. *(PREVIOUSLY CANCELED)*